

Operation and
Maintenance Instructions
OM-143

Water Test Kit
Cat. No. XX6300100
Portable Water Laboratory
Cat. No. XX6300150

MILLIPORE

FUNCTION

Water Test Kit

The Millipore Water Test Kit provides the necessary analytical testing equipment for performing coliform tests, and most other environmental microbiological tests under field conditions and shipboard conditions, or in land-based laboratories. The kit consists of a durable, portable incubator, along with a stainless steel 47 mm filter holder assembly, a vacuum syringe with tubing, S.S. forceps, a stainless steel graduated sampling cup, 4 oz. and 8 oz. plastic bottles (for alcohol and rinse water), and a wax marking pencil. All testing components are contained within the incubator lid for convenience. The filter holder assembly base is fitted with a ring-wick for use in the sterilization of the unit when used in the field. The incubator is fitted with a carrying handle, and operates at any of 12V and 24V, D.C. current, or 115V and 230V, A.C. current*. It comes complete with an electrical cord and attachments for use in an automobile, out in the field, or indoors.

Portable Water Laboratory

This kit is identical to the above but, in addition, contains the necessary expendables required to perform the coliform tests (filters, petri dishes, mEndo medium, and disposable pipettes).

EQUIPMENT PREPARATION

1. Prior to starting from the "home" base, preset the incubator to 35°C during check-out inspection. Before plugging incubator into the electric outlet, first preset the voltage selector knob to the correct voltage.* Failure to do so may blow the fuse. Now, unwind the cord (contained in the kit), fit the female plug into the well receptacle at the side of the incubator, then insert the male plug into the wall outlet. Turn the temperature (thermostat) knob to initiate the heating cycle. The red pilot lamp will light. Adjust as required until the 35°C point of the thermometer is reached and retained (with lid closed), then place marker at this point on the graduated knob plate. Leave adjustment at this point. When the kit is transported to another location, make sure that the voltage selector knob is first set for correct voltage before plugging into power source.*
2. If you plan to test several water samples while in the field, be sure to include the 4 oz. methanol bottle with enough ~~fuel to sterilize both the~~ filter holder and forceps.
3. Fill an 8 oz. bottle (or larger if necessary) with sterile phosphate buffer water for use as rinse water during the trip.
4. Prepare dilution blanks if necessary.
5. Prepare enough pre-sterilized sample bottles for any sampling procedures where the stainless steel sampling cup cannot be used.
6. Be sure to pack sufficient pre-sterilized filters, pads, petri dishes, pipettes, ampouled media, and wooden matches for the test period planned.

*For coliform samples, or other critical analyses, the 6V setting must not be used.

FILTER HOLDER STERILIZATION

1. Prepare the filter holder for sterilization by removing the stainless steel receiver "flask" from the funnel base assembly.
2. Carefully soak the ring-wick around the holder base with approximately one half capful of methanol.
3. Light a match and ignite the methanol on the ring-wick. Make sure the entire ring is ignited.
4. Close the filtering cup over the funnel and the burning wick.
5. Leave the cup in place for 15 minutes. Prior to use, remove cup, and rinse funnel thoroughly with approximately 100 ml of sterile water. Sterilization of the filter holder is accomplished by formaldehyde, a product of the incomplete combustion of methanol.

SAMPLING INSTRUCTIONS

When performing coliform analyses on finished or treated portable waters, it is necessary to test a 100 mL sample. Well waters intended for drinking purposes at times, however, may contain a higher than normal sediment level, or a high concentration of non-coliform bacteria. In these cases, the use of two 50 mL samples is acceptable. The coliform count obtained will then consist of the total of the two (100 mL). Raw water samples usually contain a large amount of suspended matter, or are highly contaminated, thus making it impractical to filter such a large volume. For sample sizes greater than 20 mL, pour the sample directly into the holder, then filter, according to instructions under Test Procedure. For samples less than 20 mL, first pour 20-30 mL of sterile dilution or rinse water into funnel, then pipette the sample into this dilution water, then filter. A sterile pipette must be used for this step.

DILUTION/RINSE WATER PREPARATION

Sterile phosphate buffer dilution or rinse waters are difficult to prepare in the field. It is important therefore to prepare sufficient quantities (in the laboratory) to satisfy the needs for their use in the field. This water should be prepared in accordance with Standard Methods for the Examination of Water and Waste Water. When, however, the need arises to prepare this material under field conditions, one of the following substitution methods will suffice.

1. Filter the sample water through a 0.45 μ Millipore membrane in the disinfected filter assembly.
2. If the sample water is reasonably free of suspended matter, boil sufficient quantity for 10 minutes, cool, then use immediately.
3. Filter the sample water through a pre-sterilized Millipore Sterivex Filter unit.

COLIFORM TEST PROCEDURE

1. If using the SO-pak filter/pad configuration, dip tips of forceps into methanol (contained in field kit), flame, then cool for a few seconds. Open flap of filter/pad envelope package and remove an absorbent pad. Close envelope. Lift lid of petri dish and aseptically place pad in dish.
2. Break open a 2 mL ampoule of m-Endo medium and pour contents onto pad. Close petri dish, mark for sample identification, and set aside until required in Step 8.
3. Pry off receiver portion of presterilized "field" filter holder from base by inserting blunt end of forceps into U-shaped slot, and moving upward in a lever-like motion. Replace receiver by fitting onto base portion equipped with nylon foot pads. With funnel in place, flush inside funnel walls and support screen with 30-50 mL of sterile buffer. This removes any residual formalin that may be present.
4. Remove funnel from filter support base. Re-open filter package and using flame-sterilized forceps, aseptically withdraw filter (HA or HC type) from envelope. Place the filter, grid-side up, onto the screen support, making sure it is centered properly. Replace funnel.
5. Attach syringe to filter holder by inserting luer adapter end of hose into luer opening of base. If sample volume is between 20 mL and 100 mL, sample can be poured directly into holder from pre-sterilized graduated sampling cup. The cup can be decontaminated between samples by swirling with alcohol and rinsing with sterile buffer. If sample volume is less than 20mL, pour 20-30 mL of sterile buffer into holder funnel, then pipette required sample on buffer. Swirl funnel while adding sample to mix sample and buffer.
6. Apply suction for filtration by pumping syringe plunger. More than enough vacuum will be created by the syringe-pump to filter any type of water sample.
7. With filter still in place, rinse the walls of the funnel with sterile buffer. Use a volume of rinse buffer equal to the total volume of the sample just filtered. Apply vacuum and draw rinse buffer through. Repeat this rinse. If sufficient buffer rinse is not available, sterile rinse water can be prepared in the field. Using the Sterivex Filter Unit, either dechlorinated tap water, or water from the sample site can be sterilized and used as the sterile rinse.
8. After rinse buffer has been drawn through filter, release vacuum (by removing syringe tubing from holder), and remove funnel.

9. Using flame-sterilized forceps, remove filter from holder base and place, grid-side up, onto the nutrient medium in the petri dish previously prepared (Step 2). Place filter into dish by lining up filter to the edge of the dish and setting it down with a slight rolling action so that it is evenly centered and free from entrapped air beneath its surface.
10. Place the closed petri dish upside down into the incubator, and incubate the coliform culture for 22-24 hrs. at 35°C.

NOTE: If the incubation is started on one source of current, to be continued or completed at a site where a different voltage source is available, reset voltage control to appropriate setting at new site. It is important to maintain incubation temperature (i.e., by connecting the power cord to the motor vehicle's cigarette lighter outlet) until change-over at the new site.

FILTER EXAMINATION

It is important to realize that when viewing and counting indicator organism colonies from drinking water, where the results may be required for legal issues, a stereoscopic microscope of 10-15X magnification, and fluorescent illuminator are necessary. When the incubation period is completed at the "home" laboratory, this will present no problem. If however, the incubation must be completed in the field, the following alternatives may be followed.

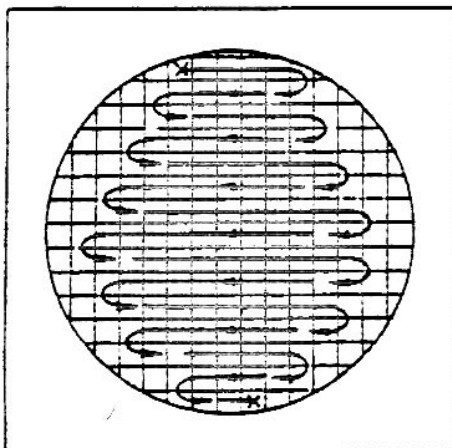
1. If the cultures can be transported to the laboratory within 5 or 6 hours after incubation, remove the lid of petri dish, wipe off condensate, if present, with the tip of a paper towel, then replace lid. Transport to the laboratory (in an inverted position) for examination.
2. If the above is not possible, then remove filter from dish and dry on a paper towel or absorbent pad (approximately 3/4 hr.). When dry, place the filter in a Millipore Petri-Slide (PD1504700) and transport to the laboratory for examination. The sheen is maintained within the colonies thus allowing filter to be examined in the dry state.

Make sure the filter is examined with lid of Petri Slide closed (to ensure flatness), or place between two 2 x 3" glass slides for viewing.

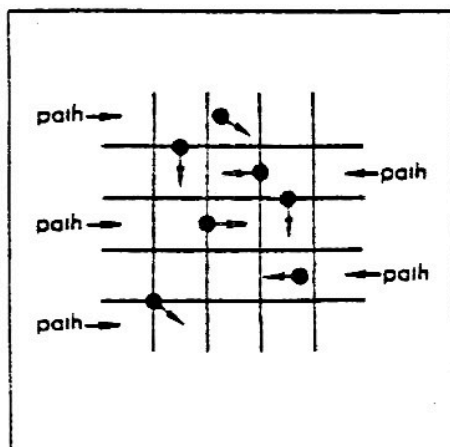
COUNTING

Only those colonies exhibiting a golden green sheen (in whole, or part) are to be counted. For valid coliform counts, no more than 80 coliform colonies should be recovered on the filter, and no more than a total of 200 of all colonies must be present. If the counts vary from this, it should be recorded accordingly. This does not apply to potable waters where the count should generally be less than one, and no filter should contain more than 4 colonies. Please refer to the Millipore manual "Water Microbiology" AB323, or Standard Methods for additional information.

For ease in counting, the diagrams that follow are a useful guide.



Use the grid system on the MF surface to locate colonies along the counting path.



Note proper location of colonies indicated by arrows pointing to various squares into which border-line colonies may be located for convenience.

To calculate count, use following formula:

$$\frac{\text{No. of sheen colonies counted} \times 100}{\text{Milliliters of Sample}} = \text{No. of indicator organisms per 100 mL}$$

e.g., 3 mL sample added to filter funnel containing 20-30 mL of sterile buffer. After filtration and incubation, 36 sheen colonies were counted. Therefore, $(36 \times 100)/3 = 1200$ indicator organisms/100 mL.

MAINTENANCE INSTRUCTIONS

Incubator

1. If a fuse is damaged, cut off power source. Turn the fuse post one-half turn counterclockwise and replace damaged fuse with one supplied in spare parts container. Reseat post by a half turn clockwise.
2. A damaged pilot lamp may be replaced by unscrewing counterclockwise the red cover and bulb. This will ensure a clean unit. To remove any nutrient which has accidentally stained the unit, a dilute solution of household bleach is recommended.
4. If extensive repairs are necessary, the unit should be returned to: Millipore Corporation, Ashby Road, Bedford, Massachusetts 01730.
5. Periodically lubricate hinges with light lubricating oil.

Filter Holder Assembly

Immediately after use, the filter support screen and gasket, and receiver-funnel should be removed from the holder base, and all stainless steel components cleaned with a sponge, hot water and a non-abrasive cleanser. Never use steel wool or abrasive materials on any part of the holder.

1. The filter support screen is held tightly in the base by friction. To remove it, hold the base upside down and slightly tilted, and strike its edge sharply against a hard, clean surface. Because the screen can easily be damaged, never use a sharp or pointed instrument to pry it from the base. The small Teflon gasket can be lifted from the screen recess with forceps, and carefully set aside.
2. A stiff bristled brush is useful in removing traces of stubborn residue, but do not use a brush on the filter support screen. It can break the screen mesh and cause a ruptured filter. A pipe cleaner with detergent solution is helpful in cleaning the inside of the holder outlet tube.
3. After cleaning, thoroughly rinse the components with clean water, and air dry. Do not wipe with paper or cloth, which will leave traces of fibers or lint. In rinsing, take special care to flush out the area under the top of the locking ring. Carefully inspect the components for signs of damage; reassemble the base with the Teflon gasket underneath the screen (which is always installed with its screen surface up). Over an extended period of use, or after filtering heavily contaminated liquids, the flat Teflon gasket under the top locking ring may accumulate dirt that will interfere with the holder's sealing action. To remove it for special cleaning or replacement, proceed as follows:
4. Invert the funnel and locking ring assembly (without base), and place it on a clean surface. Using the Allen wrench supplied, slightly loosen the two set screws in the locking ring.
5. Remove the nylon lockwheels from the locking ring and set them aside, allowing the ring to rest against the bottom of the funnel. Three set screws in the sealing collar of the funnel will now be accessible.
6. With the 5/64" Allen wrench, loosen these set screws until about 1/4" (6 mm) of each is exposed. The sealing collar can now be lifted from the end of the funnel, allowing the locking ring and flat Teflon gasket to be removed.
7. Inspect the gasket and the inner surface of the locking ring for injury or dirt, and clean them thoroughly. Small particles of embedded grit can be dislodged from the Teflon gasket without injuring it, but the gasket should be replaced if it is damaged or badly distorted.

8. To reassemble, place the clean gasket inside the locking ring and slip the ring, open side up, over the end of the funnel. Then replace the funnel collar and tighten its set screws, making sure that they rest in the groove of the funnel. When properly positioned, the end of the funnel projects approximately 1/16" (1.6 mm) beyond the face of the collar.
9. Replace the lockwheels inside the locking ring, tightening their holding screws until each wheel will not turn. The wheels should be positioned to present smooth, round bearing surfaces to the locking cams on the underside of the holder base. The set screws on the outside of the locking ring can now be tightened to keep the lockwheel holding screws from loosening during use.
10. If a flat spot develops in either lockwheel after a period of use, both wheels should be rotated to new positions, or replaced if necessary.
11. To avoid sticking of wick-base o-ring to receiver-cover, lubricate very lightly (on a periodic basis) with a silicone spray or gel.

Sanitarian Vacuum Syringe

- I. After use, the syringe and tube assembly should be removed from the wick-base, and pumped a few times to prevent the stainless balls from forming a set with the valve seats. Prior to re-use, this operation should also be carried out. If the syringe is used only as a vacuum source (air entry only), little to no regular maintenance is required. If for one reason or another the valve components are removed, make certain that the components are re-assembled in the exact configuration as originally assembled.

SPECIFICATIONS

Materials Stainless funnel, base and filter support screen anodized aluminum locking ring, nylon locking wheels, Teflon gaskets, aluminum wick-base, asbestos wick, and stainless receiver-cover.

Filter Size 47 mm diameter.

Funnel Capacity 125 mL.

Pressures Vacuum only.

Connections Luer inlet to wall of wick-base.

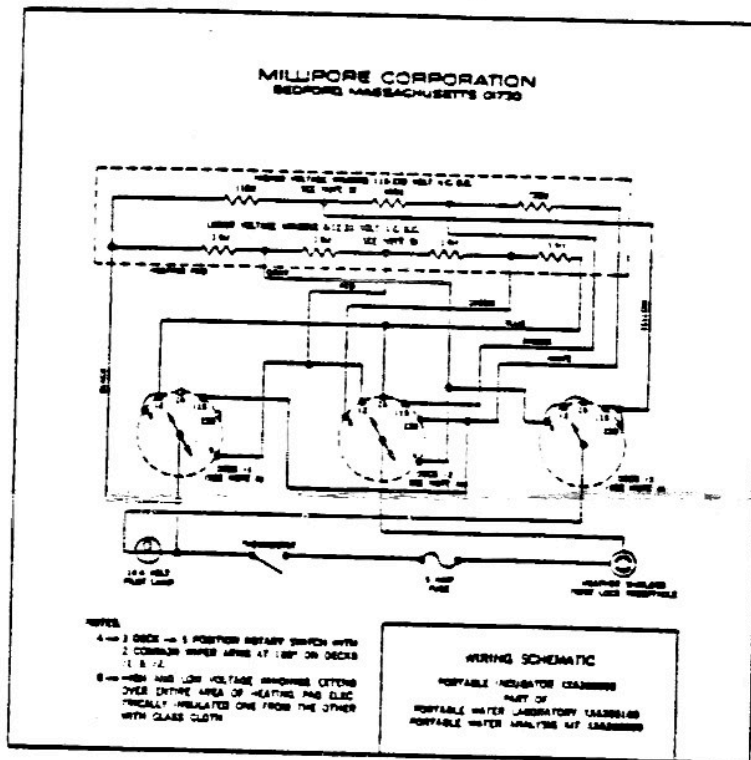
Dimensions 15 1/2" x 10 1/2" x 11 1/2".

Weight 11 lbs. complete.

COMPONENTS PARTS

Description	Catalogue No.	
Water Test Kit (N.S.N. 6665-00-682-4765)		XX6300100
Case, Carrying Reinforced Fiberglass Liner, Reinforced Fiberglass with Heating Belt and Taps, and Gaskets		---
Rack, Incubator		---
Thermometer Assembly		XX6300011
Thermometer		XX6300012
Light, Indicator (assembly)		XX6300013
Fuse Holder		00410411P
Thermostat (N.S.N. 6665-01-051-0013)		ECFH00001
Receptacle		XX6300037
Cord, Power, Electrical		0041031P
Container, Parts, Spare containing:		XX6300038
Nylon Locking Wheels		000106P
Lamp, Indicator, 14.4 V GE Miniature		XX6300053
Fuses, Cartridge (5 ea.) AGC 5		XX6300054
Wrench, Allen, 3/64		000380
Wrench, Allen, 5/64		000180
Adapter, Battery, Alligator Clip		XX6300056
Adapter, Receptacle, Cigarette Lighter		XX6300051
Filter Holder Assembly, S.S.		XX6300120
Cup, Sample, Graduated, S.S.		XX6200003
Forceps, S.S. (N.S.N. 6635-00-915-5738)		XX6200006
Vacuum Syringe (N.S.N. 6640-00-070-4874)		XX6200035
Bottle, Plastic, Alcohol, 4 oz. (N.S.N. 6640-00-500-0276)		XX6504709
Bottle, Plastic (Dil. Water, 8 oz.)		004207P
Red Pencil, Grease Marking		004213P
Incubator, Wiring Diagram Card		004213P
Portable Water Laboratory		XX6300150
All of the above, plus the following:		
Type HAWG sterile, 0.45 μ filter with absorbent pads, 47 mm. (N.S.N. 6640-00-494-7287)	100/pk	HAWG047S0
mF-Endo Medium, 2mL ampoules, sterile (N.S.N. 6550-00-687-8436)	24/pk	M0000002E
Plastic Petri Dishes, Sterile, Disposable (N.S.N. 6640-00-299-8689)	100/pk	PD1004700
Plastic Pipettes, Sterile, Disposable	25/pk	XX6300135

INCUBATOR WIRING DIAGRAM



TECHNICAL ASSISTANCE

To obtain technical assistance, call our Technical Service Department
Toll-Free at 800-225-1380.

In Western States 800-632-2708

In Massachusetts 617-275-9200

In Canada 800-268-4881

In Puerto Rico 809-739-8485

In Alaska and Hawaii 415-952-9200

Outside of U.S.A., contact the nearest Millipore office or agent listed in the Millipore catalogue.

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01730

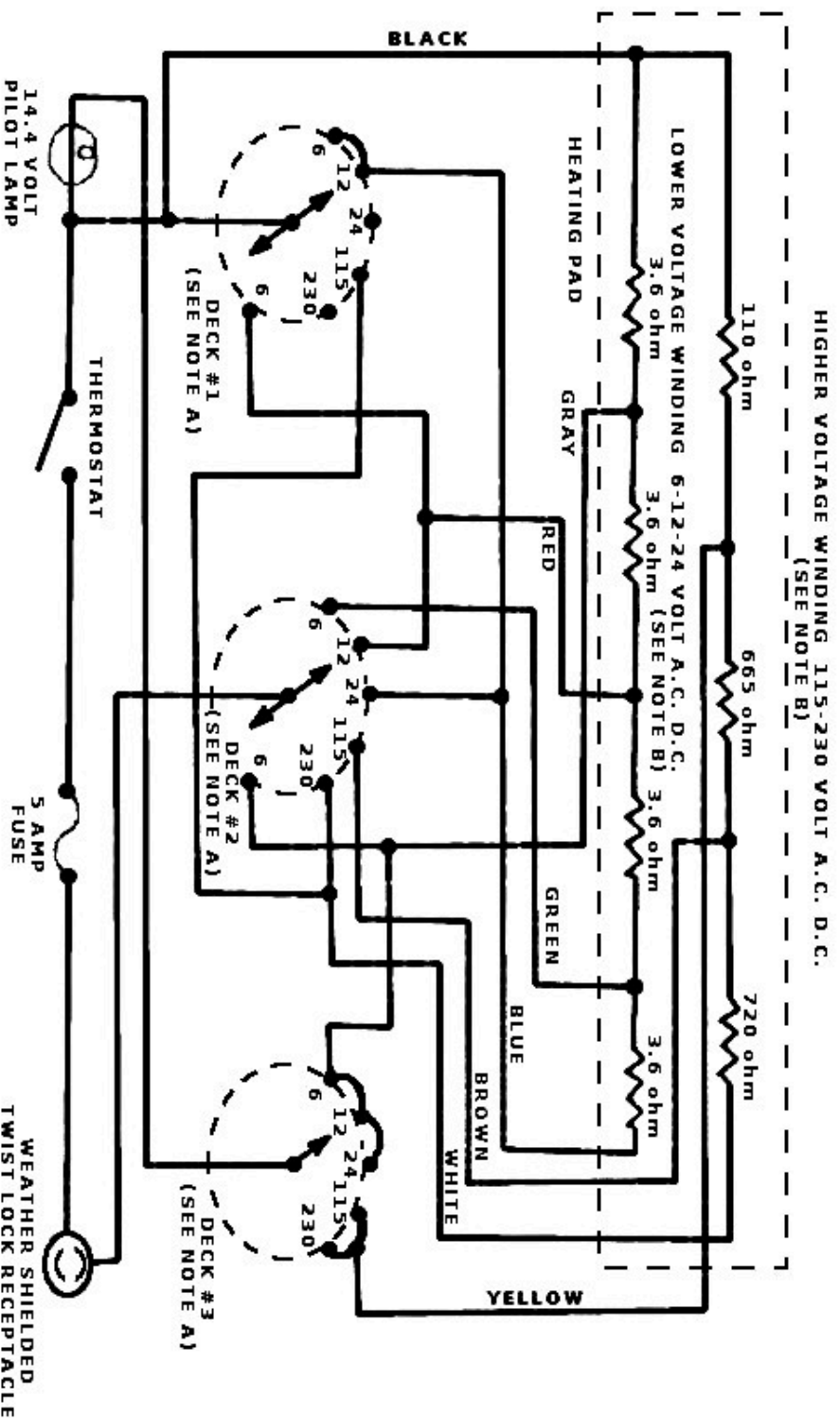
Sterivex is a trademark of Millipore Corporation.

Teflon is a trademark of E.I. Dupont de Nemours Co.

OM-143, P-15328

Rev. 6/87

BEDFORD, MASSACHUSETTS 01730



WIRING SCHEMATIC

PORTABLE INCUBATOR XX6300000
PART OF
PORTABLE WATER LABORATORY XX6300100
PORTABLE WATER ANALYSIS KIT XX6300200

NOTES:

A - 3 DECK / 5 POSITION ROTARY SWITCH WITH
2 COMMON WIPER ARMS AT 180° ON DECKS
#1 & #2

B - HIGH AND LOW VOLTAGE WINDINGS EXTEND
OVER ENTIRE AREA OF HEATING PAD ELECTRICALLY
INSULATED ONE FROM THE OTHER
WITH GLASS CLOTH